

Regis University
College for Professional Studies Graduate Programs
Final Project/Thesis

Disclaimer

Use of the materials available in the Regis University Thesis Collection ("Collection") is limited and restricted to those users who agree to comply with the following terms of use. Regis University reserves the right to deny access to the Collection to any person who violates these terms of use or who seeks to or does alter, avoid or supersede the functional conditions, restrictions and limitations of the Collection.

The site may be used only for lawful purposes. The user is solely responsible for knowing and adhering to any and all applicable laws, rules, and regulations relating or pertaining to use of the Collection.

All content in this Collection is owned by and subject to the exclusive control of Regis University and the authors of the materials. It is available only for research purposes and may not be used in violation of copyright laws or for unlawful purposes. The materials may not be downloaded in whole or in part without permission of the copyright holder or as otherwise authorized in the "fair use" standards of the U.S. copyright laws and regulations.

TECHNOLOGY INTEGRATION PROFESSIONAL
DEVELOPMENT FOR TEACHERS:
STRATEGIES FOR ACTION

by

Henry E. Hedberg

A Research Project Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Education

REGIS UNIVERSITY

February, 2008

ABSTRACT

Technology Integration Professional Development for Teachers: Strategies for Action

The purpose of this project was to present a comprehensive set of strategies for principals and school administrators to utilize for the management of professional development related to technology integration. The ability to effectively use educational technologies in teaching is becoming an increasingly important skill for teachers to possess. Through a presentation of the current research, this researcher has built a case for technology related professional development using the available technology integration data, teacher opinions and the commentary of other educational research professionals. To further support this subject as a topic for professional development, this researcher has presented a sample of the current research that demonstrates its effectiveness for teacher practice. Additionally, this author presents a sample of the technology related professional development programs and their results. The culminating product of this research is delivered in the form of a Microsoft PowerPoint presentation.

TABLE OF CONTENTS

Chapter	Page
1. INTRODUCTION	1
Statement of the Problem	1
Statement of Purpose	2
Chapter Summary	2
2. REVIEW OF LITERATURE	3
What Is Staff Development	3
Technology Integration Defined	4
Technology Integration Related Professional Development	5
The Current State of Staff Development Related to Technology Integration	6
A Case for Technology Related Professional Development	8
Technology Integration Data	8
Teacher Opinions in Regard to Preparedness and Performance	10
Student Opinions in Regard to Technology Integration in Schools	10
Support for Teacher Professional Development	11
Research on the Effectiveness of Technology Related Professional Development	13
The State of the Current Research	13
1998 NCES: Teacher Preparedness Study	14
2000 NCES: Teacher Preparedness Study	15
Teacher Leadership Project	16
Trek-21 Project	17
e-Coach Model	18
Strategies and Factors for Successful Technology Integrated Professional Development	18
Chapter Summary	23
3. METHOD	25
Target Audience	25
Organization of PowerPoint Presentation	26
Peer Assessment	27
Chapter Summary	27
4. RESULTS	28
Introduction	28
PowerPoint Presentation Slides	29

Chapter Summary	53
5. DISCUSSION	54
Contribution of Project	54
Limitations	55
Peer Assessment	56
Recommendations for Future Research and Study	57
Project Summary	57
REFERENCES	59

Chapter 1

INTRODUCTION

The introduction of educational technologies in schools has created a need for professional development that provides educators with the skills and knowledge necessary to make the most of technology investments. However, it is apparent to this researcher that professional development has not kept pace with school technology hardware expenditures and changes in school law. Instructional leaders require the knowledge and skills necessary to successfully guide their staff's professional development related to educational technology.

Statement of Problem

In 1999, the staff of the National Center for Education Statistics (NCES; 2000) surveyed teachers from public schools with access to computers or the Internet at school. Of the teachers surveyed during this study, 13% reported that they were not at all prepared to use this technology, 53% reported that they were somewhat prepared, 23% reported being well prepared, and 10% reported being very well prepared (NCES). The results from this survey indicated that teachers did not receive adequate staff development related to technology integration in the curriculum. According to Bush (2005), the No Child Left Behind Act of 2001, "calls for the combining of technology resources and systems with educator training and curriculum development to fulfill the primary goal of enhancing learning and increasing student achievement" (p. 1). With the lack of teacher training related to technology integration, and recent changes in school

law that require professional development for teachers to be combined with technology resources, it is this researcher's opinion that instructional leaders need the knowledge and skills necessary to guide the professional development of their staff.

Statement of Purpose

The purpose of this project was to present a comprehensive set of strategies for principals and school administrators to utilize for the management of staff development related to technology integration. A PowerPoint presentation was developed which provides leaders with the strategies they need to research, plan, implement, and assess current and future technology related staff development efforts.

Chapter Summary

It is this researcher's position that school leaders must possess particular skills and knowledge in order to successfully implement professional development programs related to technology integration. In Chapter 2, the Review of Literature, this researcher presents the current literature surrounding this topic, provides data to support the need for this type of professional development, and identifies researchers who have demonstrated the best practices in this field.

Chapter 2

REVIEW OF LITERATURE

The purpose of this project was to create a PowerPoint presentation for professional development focused on technology integration. This author utilized research based strategies for the planning and delivery of technology related professional development which represent the current best practices in this field. The intended audience for this guide is principals and school administrators who wish to improve their learning community with sustained professional growth opportunities that utilize the potential of learning technologies. It is the hope of this author that this presentation will influence his own future educational and administrative practices by the establishment of a basic understanding of the challenges involved in this type of activity and the actions required to overcome them.

What Is Staff Development?

According to the members of the National Staff Development Council (NSDC; 2007), “Staff development is the term that educators use to describe the continuing education of teachers, administrators, and other school employees” (p. 1). The members of this Council provided a snapshot of the activities teachers may partake in and the methods by which these opportunities might be delivered. For example, a teacher may need to learn new: (a) content, (b) pedagogy, (c) classroom management techniques, (d) ways to teach language minority students, or (e) ways to integrate technology. To reach these ends, teachers may attend classes, workshops, or conferences. However, the

members of the NSDC added that “traditional sit-and get sessions” (p. 1), like those mentioned above, may not be as effective as less traditional forms of staff development such as: (a) receive coaching, (b) work with a team to plan or study a subject, (c) keep a journal, (d) visit a model school, or (e) observe a teacher teach. Administrators of the Pennsbury School District (n.d.) in Pennsylvania defined staff development as “the opportunity for teachers to participate in intensive and on-going training. The goal is to continually improve the performance of teachers and students” (p. 2). The inclusion of the terms, *ongoing* and *continually improve*, speak of how professional development is less about meeting an end and more of a process by which educators follow throughout their careers. Another element that is included in this definition is *teacher performance*. Linking staff development to the performance plan or appraisal system is one recommended way of improving overall professional development (NSDC, 2000). Loucks-Horsley (1996) defined staff development as “Opportunities offered to educators to develop knowledge, skills, approaches and dispositions to improve their effectiveness in their classrooms and organizations” (p. 1). In her definition, she included the term, *dispositions*, to emphasize the importance of how staff development should change the attitudes of the learner to improve effectiveness.

Technology Integration Defined

The term, technology integration, seems to lack a formal definition. McLeod (2006), in his review of literature, reported that most researchers fail to define or operationalize this term. According to McLeod, when efforts were made to define technology integration, the definitions varied and were either too vague or too narrow. This may be because many authors, in an attempt to demonstrate the relevancy of their

own work, refrain from reference to specific technologies that may date or narrow the scope of their work. The term, technology integration, is always changing because, as new technologies are developed, the ideas of what students will need in order to be successful in the digital age change as well (Fulton, 1998, as cited in Valdez, 2005). Support for McLeod's opinion can be found in the work conducted by Malitz, Rogers, and Szuba (2005). According to Malitz et al., "Many organizations and publications have struggled to define 'technology integration'" (p. 1). Although different language might be used, a major theme of these definitions is that technology is a means to an end, but not the end in itself. Malitz et al. provided examples of differing views of technology integration which contain common language to support the idea of technology integration as a process that supports change. One particular example used by these researchers emphasized the point that, "Technology integration is the process of teaching technology [technology education] and another curricular area simultaneously. In addition, it is the process of using technology to enhance teaching for learning [educational technology]" (EdTech Connect, 1999, as quoted in Malitz et al., p. 1).

Technology Integration Related to Professional Development

For the purposes of this project, technology integration, as related to professional development, is defined as the opportunities offered to teachers, administrators, and other school employees to develop their knowledge, skills, and approaches related to technology integration pedagogy. A major focus of this form of staff development is on development of the dispositions of the individual and group toward technology integration in such a way that it will foster an atmosphere conducive for continuous positive change. This requires the establishment of a technology committee and

following a technology plan that provides for the physical and procedural infrastructure to support this type of environment.

The Current State of Staff Development Related to Technology Integration.

In the United States, the current expectations for the professional development of technology integration are not set high enough to take advantage of the possibilities of the current educational technologies. “School districts have spent billions of dollars putting the infrastructure in place to allow for internet access, with little left in their budgets to pay for staff training” (Sherry, 1997, as quoted in Williams & Kingham, 2003, p. 3). Brand (1997) remarked that, “schools are experiencing difficulty in effectively integrating these technologies into existing curricula” (p. 1). In 1999, researchers for the Milken Exchange on Education Technology and International Society for Technology in Education (as quoted in Lemani, 2004) wrote, “in general, professional development programs do not provide future teachers with the kinds of experiences necessary to prepare them to use technology effectively in their classrooms” (p. 2). This conclusion was supported by the research of Williams and Kingham. In the Williams and Kingham study of the perceptions of veteran and preservice teachers in regard to their own use of technology in the classroom, they concluded “that there is still a lack of infusion of technology into the curriculum” (p. 2). They suggested that teachers do not receive adequate staff development experiences to support the use of technology in the classroom. The lack of professional development, as related to technology integration, was apparent to the staff of the U.S. Department of Education (2005, as quoted by Schrum & Glassett, 2006), who reported that

We have not realized the promise of technology in education. Essentially, providing the hardware without adequate training in its use-and in its endless

possibilities for enriching the learning experience meant that the great promise of Internet technology was frequently unrealized. Computers, instead of transforming education, were often shunted to a "computer room," where they were little used and poorly maintained. Students mastered the wonders of the Internet at home, not in school. Today's students, of almost any age, are far ahead of their teachers in computer literacy. (p. 2)

According to the Editorial Projects for Education Research Center (2007, as cited in Edweek.org, 2007) during the 2005-2006 school year, 40 states had technology standards established for educators, and 33 states had standards established for school administrators. According to Bausell and Klemick (2007), during the 2006-2007 school year, these numbers increased to 45 and 36 states, respectively. This demonstrates that U.S. leaders have become increasingly focused on the need for educator proficiencies related to technology. However, willingness to go further with this notion seems to be lacking. Few states have requirements for educators and administrators to achieve competency with technology standards through coursework and subsequent testing before they receive their initial license. Even fewer states have established technology requirements for recertification of educators and administrators (Edweek.org). Bausell and Klemick noted that "nineteen states currently require teachers to complete technology coursework or testing prior to initial licensure, and just nine states have similar requirements for administrators" (p. 5). For recertification, these numbers are even lower; in only 9 states are teachers required to demonstrate competency, and 5 require administrators to demonstrate these skills before recertification.

Despite the apparent lack of technology qualifications requirements, there was an improvement in the percentage of schools where most users were considered beginners. Researchers for Market Data Retrieval (MDR; n.d., as cited in Edweek.org, 2007) reported that in 1999, 35% of the teachers surveyed were considered beginner users of

technology and, by 2005, this figure decreased to 15%. No similar data were available for 2007. According to Bausell and Klemick (2007), “States are increasingly implementing policies or programs that encourage, rather than require, educators to be familiar with technology” (p. 6). In 2007, 39 states offered online professional development to teachers, and one-third of the states offered incentives to use technology in the classroom or complete technology training. These data indicated that state officials had seen the value in the utilization of technology for staff development, but Bausell and Klemick noted that “the vast majority of public schools still use traditional face-to-face methods for professional development” (p. 6).

A Case for Technology Related Staff Development

Technology Integration Data

It is becoming increasingly important for educators to integrate educational technology into their curriculum.

In February of 1996, President Clinton issued a challenge to schools and educational leaders to prepare “technologically literate” students by the 21st century. Recognizing the importance of the Internet in the future of education, the Clinton Government mandated that all classrooms should be connected to the Internet by the year 2000, and all teachers must be trained to integrate this technology into the curriculum. (U.S. Department of Education, 1996, as quoted in Williams & Kingham, 2003, p. 2).

Brand (1997) explained that there is a need for “Increased access to information through new technologies, along with the need to prepare children to compete in an emerging information-based global economy, promises to fundamentally reshape school practice as we move into the next century” (p. 1). The effects of these changes can be seen in U.S. public schools where the focus on simply having access to information technology in the school facility has shifted toward consideration of the actual placement and proximity to

each student. In 1994, 35% of U.S. public schools had access to the Internet in the school facility, but by 2005, 94% of U.S. public schools had access to this technology in the instructional room (Lewis & Wells, 2006). Also, the decline in student-to-computer ratios in U.S. public schools indicated a focus on the provision of students with direct access to information technologies. According to Lewis and Wells, the average ratio of students to computers with Internet access in U.S. public schools decreased from 12.1:1 in 1998 to 3.8:1 in 2005. Yet, as student access to these instructional technologies has increased, staff development that is focused on training teachers how to use them in the classroom has not kept pace. In the No Child Left Behind Act of 2001 (NCLB), there are requirements for states to allocate 25% of all federal technology dollars to staff development; however, overall funding for these activities does not meet this level.

According to Ansell and Park (2003),

States have devoted the bulk of their technology funding to hardware and software improvements. Market Data Retrieval reports that almost 66 percent of school technology spending is projected to go to hardware, and a little more than 19 percent to software. Staff development is expected to capture 15 percent of most schools' technology budgets, an increase from 14 percent in 2001. (p. 2)

Without the funding for technology related professional development, it has been difficult to implement this type of training for teachers.

Lewis and Wells (2006) reported that 51% of the fulltime public educators, who were surveyed by the NCES, responded that they participated in staff development focused on the integration of educational technology in the grade they taught. By 1998, this number increased from 51% to 78% and, by 2000, 74% of fulltime public educators reported participation in educational technology staff development. Although there is no similar survey data for 2006, Lewis and Wells reported that, in 2005, only 36% of the

U.S. public schools surveyed provided 76% or more of the teachers in the school with instruction on how to integrate the Internet into the curriculum in the last 12 months. These data supported Becker's (2000, as quoted in Burns & Polman, 2006) comment that, "The majority of computer use across subject areas where computer skills are not the direct goal remains 'skill and practice' software or traditional computer-aided instruction" (p. 2).

Teacher Opinions in Regard to Preparedness and Performance

Teacher opinions in regard to their own preparedness to integrate technology in the classroom reflected an inadequate level of staff development in schools. According to the NCES (2000), 57% of fulltime public educators, surveyed in 1998, reported that they felt moderately well prepared to very well prepared to integrate educational technology in the grade level or subject they taught. In 2000, this number increased to 66% (NCES). This percentage is still far from adequate when one considers that the student-to-computer ratio dropped to 6.6:1 in 2000 and was 3.8:1 by the year 2005 (Lewis & Wells, 2006).

Student Opinions in Regard to Technology Integration in Schools

In addition, reports on student attitudes supported the idea that teachers are unprepared to integrate technology. In a qualitative study of the attitudes and behaviors of Internet using middle and high school students, Arafeh and Levin (2002) reported that "nearly every online teen (94% of 12 to 17 year olds who report using the Internet) has used the Internet for school research" (p. 8). Additional data from this study indicated that students viewed this technology favorably as a tool for learning. However, in this same study, the researchers reported "that there is a substantial disconnect between how

they use the Internet for school and how they use the Internet during the school day and under teacher direction....for the most part, students' educational use of the Internet occurs outside of the school day, outside of the school building, outside the direction of their teachers" (p. 4). Viadero (2007) supported the Arafah and Levin data when he reported that "students' use of technology outside school is already outstripping their use of it in classrooms" (p. 4). According to Arafah and Levin, students reported that although they sometimes received effective and relevant assignments that utilized the Internet, a majority of these assignments seemed to have questionable educational value. Furthermore, students in this study seemed to be "uniformly more interested in-and saw more value in-doing schoolwork that challenged and excited them" (p. 31).

Support for Teacher Professional Development

The idea that students are eager for more challenging and exciting work seems to support the remarks of other researchers in regard to technology use in the classroom. According to Doherty (1998, as cited in Williams & Kingham, 2003), in order for the Internet to reach its fullest potential, teachers must be working at higher levels, such as those identified by Sunai et al. (1998, as cited in Williams & Kingham). Sunai et al. suggested that, when teachers work at higher levels, they "construct curriculum and projects not possible without the use of the Internet...and students construct their own projects; their learning and use of the Internet is self-directed" (as quoted in Williams & Kingham, p. 3). However according to Sunai et al., few teachers work at these higher levels. This could be an indication that the staff development needs of teachers were not being met in regard to technology integration and, in turn, they were unable to take advantage of the educational potential of the Internet.

There has been a call for an increase in the quality and quantity of opportunities for technology integration staff development offered to teachers. According to Valdez (2005), “Research clearly indicates that the single most important factor in the effective use of technology is the quality of the teacher knowledge of effective technology uses in instruction” (p. 8). Coppola (2004, as cited in Valdez, 2005) reported that:

The effect of technology on students' access to knowledge is determined by the pedagogical knowledge and skill of teachers. Technology enables teachers with well-developed working theories of student learning to extend the reach and power of those theories; in the absence of these powerful theories, technology enables mediocrity. (p. 8)

Coppola suggested that educational technology use that is not supported by teacher training can ultimately lead to a worsening of teaching practices, because these tools require a degree of skill in order to be utilized effectively (2004, as cited in Valdez, 2005). The pitfalls of educational technology use without teacher training have been noted. Williams and Kingham (2003) stated that, “Doherty (1998) warns against the Internet becoming a passive learning technology by serving only a lower level information retrieval function” (p. 4).

According to Bell and Ramirez (1997), the provision of equitable access and use of technology must be one of the overriding goals of any district technology plan. “Appropriate funding and professional development represents the key means of supporting equitable access and use of technology to ensure technology literacy and to support meaningful learning for all students” (p. 1). According to Briggs (2006), “Without knowledgeable teachers, money spent on new technologies can easily go to waste.” (p. 1). In addition, “priority must be given to staff development now if we want

the financial investment in infrastructure to pay off” (Johnson, 1998, as quoted in Williams & Kingham, 2003, p. 3).

While some researchers have called for changes in the number of technology related staff development opportunities for teachers, others call for more professional development in general. “The National Education Association recommends that 50 percent of teachers' time be given to professional development” (Cook & Fine, 1997, p. 3). According to Cook and Fine,

When professional development is redefined as a central part of teaching, most decisions and plans related to embedding professional development in the daily work life of teachers will be made at the local school level. Some reformers recommend that at least 20 percent of teachers' work time should be given to professional study and collaborative work. (p. 3)

Research on the Effectiveness of Technology Related Professional Development

The State of the Current Research

The results from many studies demonstrate the relationship between technology related staff development and improved teacher performance. However, few were based on research, as required by the No Child Left Behind Act of 2001 and the Education Sciences Reform Act of 2002 (both cited in Viadero, 2007). Schrum and Glassett (2006) noted that there is a lack of scientifically based research data to guide decisions related to technology staff development. Also, these researchers pointed out that most research in this area is focused on educational significance, but it falls short of the use of scientifically based methods and statistical practices. The same can be said for research related to the impact of educational technology on student achievement. According to Schrum and Glassett,

In the area of educational technology, hardware and software have been in our schools in substantial concentration for almost two decades, and considering the

heavy investment required to put it into schools, it is important to base its implementation and use on proven best practices. The body of usable research currently available, however, is scant and scattered. To date there have been few documented systemic increases in student achievement and learning that are directly attributable to technological innovation. (p. 2)

This author found this to be true in this review of literature. Most of the data do not seem to be derived from studies that were based on sound experimental designs or were conducted with the use of large sample groups. The following information is based on national data and three studies that linked the development of technology integration skills in teachers to improvements in teacher self-efficacy and professional practice.

1998 NCES: Teacher Preparedness Study

In a teacher preparedness study conducted by the NCES (1999), an association was demonstrated between on the job technology integration training for teachers and teacher self-perception. “In general, teachers who had participated in professional development in a content area were more likely than their peers to indicate that they felt very well prepared for that area” (p. 3). In another section of this study, the NCES researchers found a positive correlation between the intensity of technology integration related staff development and a teacher’s self-perception of preparedness to perform those activities. As the number of hours of technology integration training increased, so did a teacher’s feelings of preparedness. Also, these data indicated that there was a positive correlation between a teacher’s perception of preparedness and collaboration. When teachers participated in collaborative activities, such as: (a) networking with other teachers, (b) collaborative research on a topic of interest, (c) regularly scheduled collaboration, (d) mentoring, or (e) being mentored, they were more likely to report feeling well prepared to integrate technology. This finding suggested that the provision

of long term opportunities for professional development related to technology integration, which allows teachers to regularly collaborate with professionals within and beyond the school walls, can be very effective.

2000 NCES: Teacher Preparedness Study

Also, the NCES (2000) staff conducted another study to measure teacher preparation and development. This study was similar to the NCES (1999) study to measure a teacher's perception of performance, but the researchers went further and measured the effectiveness of teacher follow-up to professional development. The results from this study demonstrated a correlation between staff development and a teacher's perception of teaching performance. The researchers at NCES wrote, "the number of hours teachers spent in professional development activities was related to the extent to which they believed that participation improved their teaching" (p. 2). Of the teachers who participated in more than 8 hours of staff development related to technology integration in the classroom, 38% reported it had improved their teaching a lot, and 13% of the teachers who participated in 1-8 hours of this type of staff development reported it had improved their teaching a lot. Also, teacher self-perceptions of how certain collaborative activities improved their teaching were measured. Again, professional collaboration was considered by teachers to have improved their teaching. In addition, the frequency of collaboration had a positive influence on teacher perceptions of performance. In addition, measurement of the effectiveness of certain follow-up activities to professional development demonstrated a positive impact on teacher perceptions of preparedness to meet the overall demands of their teaching assignment. The extent to which these activities were implemented had an effect as well. For

example, when teachers helped each other implement new ideas, to a moderate or large extent, 98% of the teachers felt moderately to very well prepared to meet the overall demands of their teaching assignment. This finding suggested that staff development should have an extensive collaborative element with built in long term professional development activities that are team oriented.

Teacher Leadership Project

Dean (2000) discussed the effectiveness of the Teacher Leadership Project (TLP), a teacher technology preparation program that was partially funded by the Gates Foundation. During this project, teachers were provided four intensive workshop training sessions of several days each during a 10 month period. During these workshops, the teachers received hands-on opportunities to learn new instructional technology methods and integrate them into their existing lessons. To study the effects of this model, Dean utilized a pre-experimental design, where he measured the differences in responses between the pre and post surveys with no control group to which the treatment group was compared (AllPsych Online, 2004). The results from this study indicated that the teachers: (a) attitudes toward technology integration, (b) self-efficacy, and (c) frequency of technology integration were positively affected by the treatment of this professional development model. Additionally, teachers who attended the training perceived that the instructional technologies they used had a greater impact on their role as a teacher and on student learning experiences. Dean demonstrated that there was a correlation between long term technology integration training opportunities and improvements in teacher attitudes toward instructional technologies.

Trek-21 Project

The Trek-21 project (Kuhn, Lemani, Wells, Mitchem, & Wells, 2003) provided another example of how well planned, collaborative, and long term technology integration training can correspond with positive changes in teaching behaviors. According to these researchers, “Trek 21 is a three-year project designed to bring about a deep lasting change in educators through the integration of instructional technologies (ITs) into their teaching” (p. 1). Trek 21 provides a cycle of opportunities for teachers to: (a) study lessons, (b) develop technical skills, (c) work collaboratively to improve their teaching, and (d) receive coaching. Kuhn et al. examined data collected with four instruments administered during the first 2 years of this project. The instruments used were: (a) the Principles of Adult Learning Scale (PALS; Conti, 1989, as cited in Kuhn et al.), an instrument designed to measure a teacher’s shift toward learner-centered teaching; (b) daily evaluations, instruments used to assess achievement of daily objectives and overall impact of the professional development; (c) indicators of instructional change instruments to assess the indicators of instructional change, such as an increase in active student engagement, an increase in instructional technology use, and the inclusion of instructional variables; and (d) an email survey of instructional technology usage, a tool used to investigate the sustained use of instructional technologies of participants after the Trek-21 project (Kuhn et al.). The results from the PALS indicated that, after the participation in Trek 21, teachers demonstrated a greater preference for learner centered teaching. Based on the data provided by the daily evaluations, Kuhn et al. found that the objectives were not only met on a daily basis, but the overall design of the program had a positive impact. Kuhn et al. remarked that the pre and post measurements for

competency indicated that Trek 21 “positively influenced teachers’ instructional technology competencies” (p. 8). Also, Kuhn et al. reported that the Trek 21 model resulted in a shift in instructional design. After the training, teachers were more likely to include instructional technologies in their lessons and utilize active student engagement. Results from the e-mail survey of Instructional technology usage indicated that the Trek 21 project had a long term impact on teacher usage of instructional technologies.

e-Coach Model

Verock-O’Loughlin (2006) studied the use of technology coaches to assist with the transformation of teachers into technology integrators. The technology coaches in this project were termed e-Coaches and were teachers who were previously provided with graduate instruction in technology professional development. The e-Coaches and teachers were then paired to form e-Teams, where the coach acted as a personal trainer for the teacher. Teachers were required to work with their e-Coach on at least two projects during the duration of the study, and they assisted teachers by helping them meet personal technology goals with the infusion of technology in lessons. According to Verock-O’Loughlin, the e-Coach model was a productive process, overall, and had an impact on: (a) teacher readiness and confidence in technology integration, (b) the learning of new technical skills, (c) the use of technology as an instructional tool, and (d) how teachers used technology as a professional and curriculum development tool.

Strategies and Factors for Successful Technology Integrated Professional Development

The establishment of an appropriate environment for the successful integration of technology is an extremely complicated task that hinges on the success of various components. This author has had extensive experience with this process, and in many

cases, the established system for the justification of expenditures and the reality in the classroom seem contradictory. For example, it is unlikely that teachers will transform into competent technology users in schools where the hardware and software resources are not available (Southeast Initiatives Regional Technology in Education Consortium, SEIR TEC, n.d.). However, in most cases, school staff must show competence or a desire to use technology before this type of expenditure is made. Add to this the fact that technology is always changing, remains relatively expensive on a per pupil basis, and teachers enter the classroom with varying degrees of skill with technology, and it becomes extremely difficult to establish a consistent technology integration system that is adaptive to changes (Valdez, 2004). In the event that a school receives funds for technology integration, it becomes imperative for administrators to quickly and effectively utilize these resources to impact student achievement and prove the capacity for their technology integration system. For these reasons, it is important for school administrators and instructional leaders to focus on particular strategies and factors that will promote the success of technology integration in their schools. These factors are centered on leadership, planning, professional development and evaluation but, most importantly, they rely on the school leader to establish a capacity for change by the provision of top-down support for bottom-up reform (Burns & Polman, 2006; Darling-Hammond & McLaughlin, 1995; Valdez; SEIR TEC, n.d.).

According to the SEIR TEC (n.d.) staff, “Leadership is the single most important factor affecting the successful integration of technology. Leaders must be energetic and committed to the use of technology as a tool for teaching and learning” (p. 2). Valdez (2004) stated that the “knowledgeable and effective school leaders are extremely

important in determining whether technology use will improve learning for all students”

(p. 1). Also, he stated,

Technology leadership is a combination of strategies and techniques that are general to all leadership but require attention to some specifics of technology, especially those related to providing hardware access, updating rapidly changing technology, and recognizing that professional development and the use of technology are constantly evolving. (p. 14)

Leaders must have a vision of what is possible with technology integration and support

teachers in this endeavor (SEIR TEC; Valdez). “Effective principals lead by example”

(SEIR TEC, p. 2). Principals know how technology supports learning; therefore, they use technology, and they attend professional development sessions with staff.

To successfully integrate technology, principals must ensure staff and community buy-in by sharing in the technology integration leadership role (SEIR TEC, n.d.). This is done through the establishment of committees that make decisions and develop school wide technology integration plans. These plans include professional development and ways to evaluate the effectiveness of the program.

In addition, leaders must understand that time is required for the success of any technology related program, and a school technology plan must have accommodations for this time. According to Dwyer et al. (1991, as cited in SEIR TEC, n.d.), “teachers go through predictable stages in their use of technology and that this process takes from three to five years” (p. 4). To change practice, Tomasino (n.d., as cited in Briggs, 2006) suggested that teachers receive at least 80 or more hours of technology integration training. According to Burns and Polman (2006), “Previous studies have shown consistently that teachers need time to become comfortable with the machines” (p. 2). Researchers for the National Center for Research on Teacher Learning (NCRTL; 1995)

addressed the need for time in their framework for teacher professional development. According to these researchers, “teachers need time and mental space to become involved in the sometimes protracted process of changing roles and practices” (p. 4). Schrum and Glassett (2006) stated that “Fullan suggests that teachers as learners require time to gain knowledge and then weave that knowledge into what they know and do in their instructional lives” (p. 3). According to the NCRTL staff, “to achieve time and mental space professional development must be redefined as a central part of teaching” (p. 4).

Professional development must be focused on instruction and how the use of technology will make learning more effective. To provide this type of training, the members of SEIR TEC (n.d.) recommended the use of a training-of-trainers model, where a core of knowledgeable teachers are trained in one building and held responsible for the dissemination of training to the remaining staff. Beyond the expertise of the in-house trainers, also, the SEIR TEC members recommended that teachers have access to professionals with expertise in technology and pedagogy. These recommendations are similar to the support described in the Trek 21 and e-coach professional development models discussed previously (Kuhn et al., 2003; Verock-O’Loughlin, 2006). Also, researchers suggested that teachers need to have the ability to immediately integrate the technology into their teaching and be supported in its use through a long term approach to staff development (Burns & Polman; Verock-O’Loughlin). One shot workshops are not effective methods to provide technology related professional development.

Brinkerhoff (2006) cited Becta (2003) and Ertmer (1999) and stated “There is general agreement among leaders in the field of educational technology that, due to a variety of barriers, teachers often fail to capitalize on the educational potential offered by

technology resources. Barriers are defined as any factor preventing or restricting teachers' use of technology in the classroom” (p. 2). According to Brinkerhoff, “Barriers impacting technology integration may be grouped into four main categories: resources, institutional and administrative support, training and experience, and attitudinal or personality factors” (p. 2). In a discussion of the research that surrounds technology integration in primary through grade 12 schools, Schrum and Glassett (2006) identified several common barriers to successful technology integration. Among these factors, Schrum and Glassett indicated that “inadequate funding, access to equipment, lack of time, and comfort or knowledge about the technology” (p. 4) are common issues that schools face. Holznogel (2005) cited five major component areas that are required for effective technology integration: “physical facilities, capacity and conditions; curricular connections; teacher actions and characteristics; student activities; and support” (p. 2). According to Holznogel, the physical facilities, and the other areas involve access to technology within the facility in order to ensure efficient teaching and learning. Curricular connections involve the alignment of technology goals to curricular ones, and teachers use technology as a means to student independence. Teacher actions and characteristics include how a teacher uses technology as a teaching tool. Holznogel suggested that teacher use of technology in varying ways must be observable on a daily basis, and teachers should encourage students to choose appropriate learning technologies. Student activities involve students’ independent use of technology as a learning tool. Support includes the staff development opportunities, as well as the structure of collegial support present in the school.

Technology integration, as a subject for professional development, has the potential to positively influence every aspect of teacher performance. This is because “Technology involves the tools with which we deliver content and implement practices in better ways” (Earle, n.d., as quoted in Holznogel, 2005, p. 1). The integration of technology enables a teacher with the appropriate tools to: (a) motivate students with engaging schoolwork, (b) teach vital skills that will enable learners to take control of their learning, (c) improve the effectiveness of teaching, and (d) increase collaboration within the entire learning community. However, many factors must be considered, and a focused strategy for change must be implemented in order for the benefits of technology integration to be realized.

Chapter Summary

As demonstrated in this review of literature, there is a large body of evidence that supports the need for technology integration related professional development for educators. Through an examination of the current data and literature that surrounds this topic, this researcher finds that leaders in the United States have not set high enough expectations for teacher use of technology in the classroom by the establishment of technology requirements for certification and recertification. It is apparent, through an examination of the research surrounding this subject, that teacher attitudes toward technology integration in the classroom and their practices are positively affected by technology related professional development opportunities. Also, several researchers have called for an improvement in the quantity and quality of professional development opportunities for educators related to technology integration in the classroom. Some researchers have gone so far as to suggest that the use of educational technologies

without training can be detrimental to teacher practice and can be a wasted investment of school resources. Several studies have demonstrated a relationship between teacher performance and technology related staff development, yet few have used scientific methods. Despite this flaw, this author found ample evidence that teacher competencies with educational technologies, as well as attitudes and self-efficacy toward technology integration, were positively affected by staff development that was: (a) well planned and goal oriented, (b) frequently provided over the course of the school year, (c) collaborative, (d) hands-on, and (e) evaluated using surveys and teacher data. However, in order to implement these strategies, the school staff requires effective leadership. The principal must: (a) support the school vision for technology integration, (b) be willing to share in the leadership role, and (c) support teachers with the needed financial investment.

As this researcher studies to become a leader of educators, it is his opinion that there is a need for a guide that distills the current research that surrounds professional development related to technology integration into an easily accessible form. In Chapter 3, this researcher describes the method, target audience, goals, and procedures for the development of this project.

Chapter 3

METHOD

Good leadership has been clearly identified as a key ingredient to successful technology integration. Leaders who are effective at developing the skills of their staff and promoting positive attitudes toward technology use are rewarded with teachers who feel better prepared to teach and are more effective teachers (NCES, 1999). This researcher has noticed through his own work that many principals lack the understanding of how to provide teachers with the professional development that is necessary to make technology integration an effective tool. Through an examination of the current literature on this topic, it became apparent to this researcher that there are many examples of successful technology related professional development programs, and many of these programs share similar elements. It is this researcher's intent to present these elements in a concise and easy to access format for principals and school administrators to utilize for the management of staff development related to technology integration. A PowerPoint presentation provides leaders with the basic strategies they need to research, plan, implement, and assess current and future technology related staff development efforts.

Target Audience

This project is designed for principals and school administrators who seek to improve the technology integration skills of their staff. This researcher will be the initial user of this information as he embarks on his new career in school administration. As this project is refined through future applications, it is the intention of this researcher to

compile a field tested guide for use by administrators.

Organization of PowerPoint Presentation

The goal of this project was to create a presentation of the best practices related to technology integration professional development that will have a positive impact on teacher skills when applied as part of a school technology plan. This researcher hopes that, by providing school leaders with these strategies, they will not only better understand their role as instructional leaders, but also feel more confident as they manage the professional development needs of their staff. The first section of this presentation contains a short discussion on the subject of professional development as it relates to technology integration. The culminating product of this section is a definition for professional development focused on technology integration. The second section of this presentation contains a series of comments from researchers that demonstrate the current state of professional development related to technology integration in schools. This section ends with a series of questions for the audience to answer and discuss. The third section of this presentation contains some select comments and data that support the case for technology related professional development. School technology data, teacher and student opinions and commentary from researchers are all used to support this position. The fourth section of this presentation contains information from three sources that demonstrate the effectiveness of technology related professional development. Commentary from researchers who studied national survey data and two different technology integration training projects are presented in this section. The last section of this presentation contains a collection of the key elements found in effective technology integration related professional development programs. These elements are organized

into four categories: (a) leadership, (b) professional development, (c) evaluation, and (d) planning. One example of implementation is presented to provide clarity on how to use these strategies. The conclusion of this presentation contains a short summation of how technology empowers teachers.

Peer Assessment

This project was assessed by two principals and one member of the Educational Technology and Information Literacy department within Adams District 12 Five Star Schools in Thornton, Colorado. These individuals were given a draft copy of the PowerPoint slides and asked to provide feedback. Specifically, the reviewers were asked to consider the: (a) fulfillment of objectives, (b) format or ease of understanding and use, (c) value or usefulness, and (d) recommended changes. This researcher met with each of the evaluators to discuss their recommendations. Their feedback is summarized in Chapter 5.

Chapter Summary

Through his own research and experience, it has become apparent to this researcher that school leaders need to possess better knowledge and skills for effectively managing professional development related to technology integration. In Chapter 4, a PowerPoint presentation of best practices that principals and school leaders can use to successfully manage technology related professional development is presented.

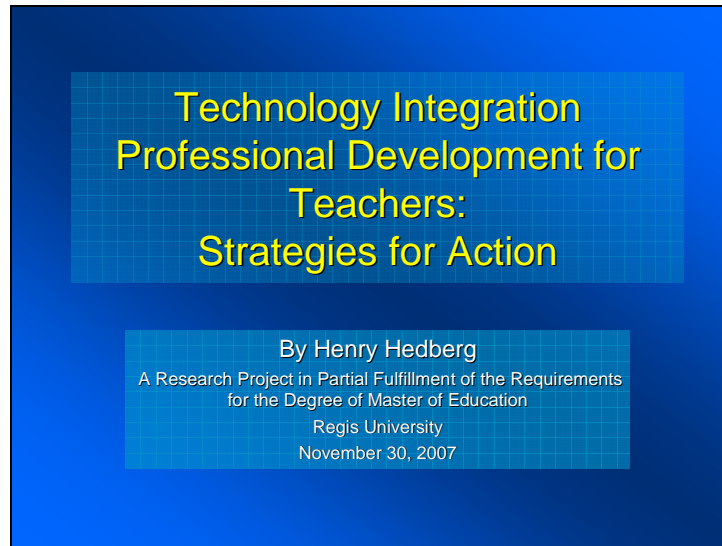
Chapter 4

RESULTS

Introduction

This research project was developed as a live PowerPoint presentation. This researcher's intentions are to present this project directly to his audience as part of an effort to impact their attitudes toward professional development related to technology integration. Throughout the presentation, this researcher will act as a facilitator to stimulate thoughtful discussions and conversations regarding the implications of the information presented.

Slide 1

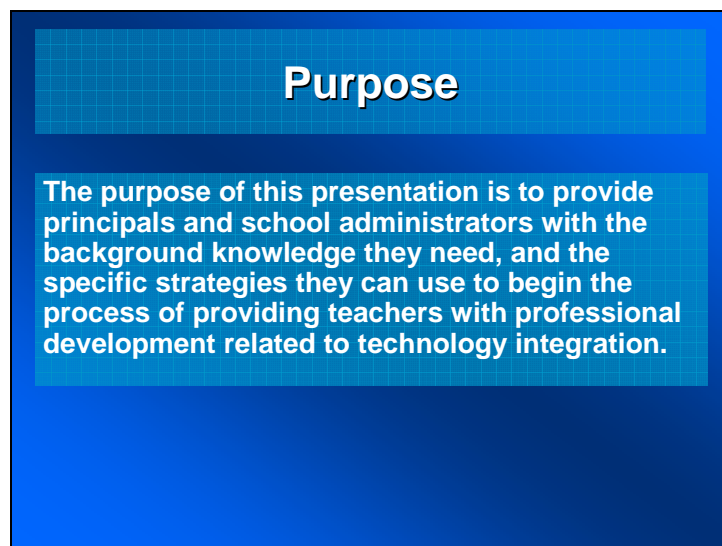


The slide has a blue gradient background with a subtle grid pattern. The title is centered in a yellow font. The author's name and project details are in a smaller white font at the bottom.

Technology Integration Professional Development for Teachers: Strategies for Action

By Henry Hedberg
A Research Project in Partial Fulfillment of the Requirements
for the Degree of Master of Education
Regis University
November 30, 2007

Slide 2



The slide has a blue gradient background with a subtle grid pattern. The title 'Purpose' is in a large white font. The body text is in a smaller white font.

Purpose

The purpose of this presentation is to provide principals and school administrators with the background knowledge they need, and the specific strategies they can use to begin the process of providing teachers with professional development related to technology integration.

Slide 3

Professional Development

“Staff development is the term that educators use to describe the continuing education of teachers, administrators, and other school employees” (National Staff Development Council; 2007, p. 1).

A teacher may need to learn new:

- (a) content
- (b) pedagogy
- (c) classroom management techniques
- (d) ways to teach language minority students
- (e) ways to integrate technology

Slide 4

“Traditional sit-and-get sessions” may not be as effective as less traditional forms of staff development such as:

- coaching
- working with a team to plan or study a subject
- journaling
- visiting model schools
- observation

(NSDC, 2007, p. 1).

Professional development is “the opportunity for teachers to participate in intensive and *on-going* training. The goal is to *continually* improve the performance of teachers and students” (Pennsbury School District (n.d.) p. 2).

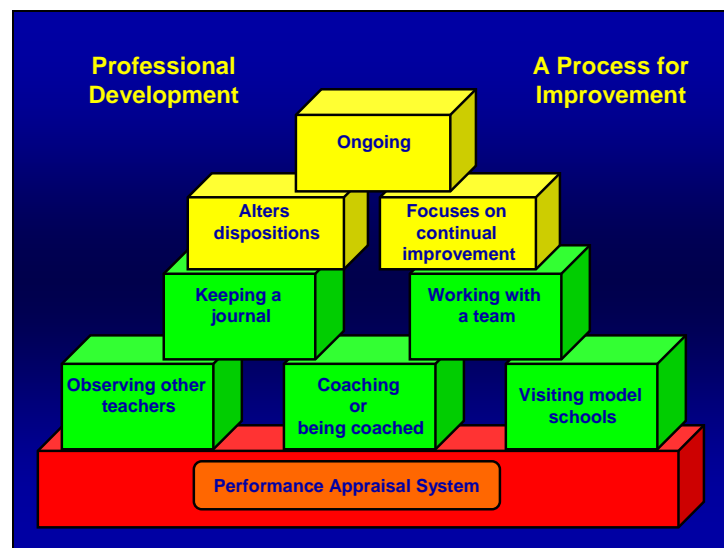
Linking staff development to the performance plan or appraisal system is one recommended way of improving overall professional development.

Slide 5

Loucks-Horsley (1996) defined staff development as:

“Opportunities offered to educators to develop knowledge, skills, approaches and dispositions to improve their effectiveness in their classrooms and organizations.”


Slide 6



Slide 7

Technology Integration


The term “technology integration” is always changing, because as new technologies are developed, the ideas of what students will need in order to be successful in the digital age change as well



```
graph LR; A[Desktop Computer] --> B[Laptop]; B --> C[Tablet]; C --> D[Smartphone]; E[Camera on Stand] -- WWW --> F[Projector];
```

Slide 8

“Technology integration is the process of teaching technology [technology education] and another curricular area simultaneously. In addition, it is the process of using technology to enhance teaching for learning [educational technology]”
(EdTech Connect, 1999, as quoted in Malitz et al., p. 1).



```
graph LR; Teacher[Teacher] --> Screen[Projector Screen]; Student[Student] --> Camera[Digital Camera]; Camera --> Butterfly[Butterfly]; Laptop[Laptop] --- Table[Table]; Pitcher[Pitcher] --- Table;
```

Slide 9

Professional Development Focused on Technology Integration

Professional development focused on technology integration will be defined as the opportunities offered to teachers, administrators, and other school employees to develop their knowledge, skills, and approaches related to technology integration pedagogy. A major focus of this form of staff development is on development of the dispositions of the individual and group toward technology integration in such a way that it will foster an atmosphere conducive for continuous positive change.

Slide 10

The Current State of Professional Development

The state of technology in our schools is evolving faster than the professional development of our teachers.....

Slide 11

Schools focus more resources on infrastructure and not enough on training staff.

Schools have difficulty effectively integrating educational technologies into the curriculum.

Professional development programs do not provide future teachers with the kinds of experiences necessary to prepare them to use technology effectively in their classrooms.

Slide 12

In the Williams and Kingham (2003) study of the perceptions of veteran and pre-service teachers in regard to their own use of technology in the classroom, they concluded

“that there is still a lack of infusion of technology into the curriculum” (p. 2). They suggested that teachers do not receive adequate staff development experiences to support the use of technology in the classroom.



- **What impact has this investment had on student achievement?**
- **How many teachers in your school regularly use these technologies to enhance instruction?**
- **What role has professional development had in the success of these tools in your school?**

"We have not realized the promise of technology in education. Essentially, providing the hardware without adequate training in its use-and in its endless possibilities for enriching the learning experience meant that the great promise of Internet technology was frequently unrealized. Computers, instead of transforming education, were often shunted to a 'computer room', where they were little used and poorly maintained. Students mastered the wonders of the Internet at home, not in school. Today's students, of almost any age, are far ahead of their teachers in computer literacy" (U.S. Department of Education, 2005, as quoted by Schrum and Glassett, 200, p. 2).

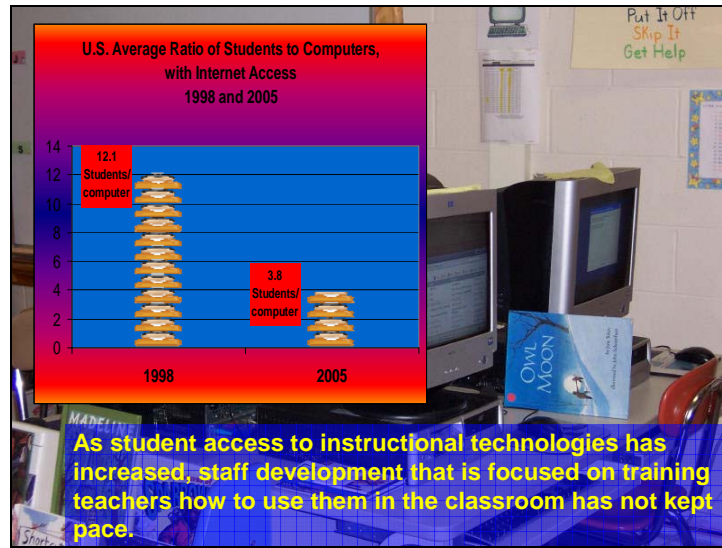
A Case for Technology Related Professional Development

In February of 1996, President Clinton issued a challenge to schools and educational leaders to prepare "technologically literate" students by the 21st century.

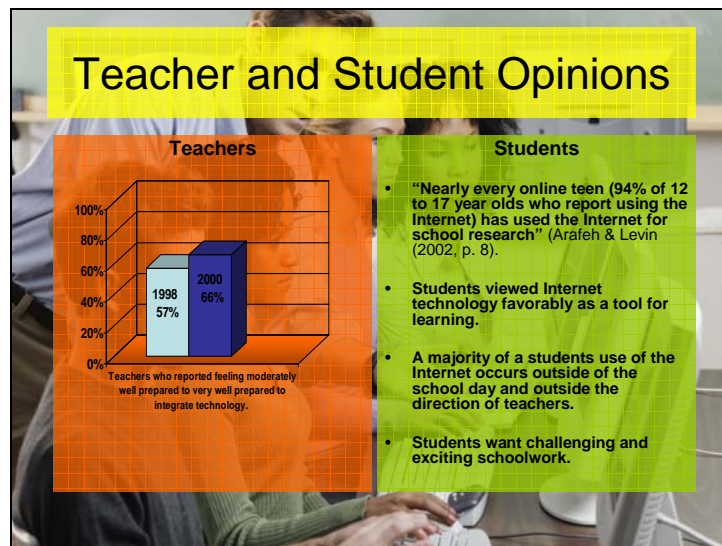
"Recognizing the importance of the Internet in the future of education, the Clinton Government mandated that all classrooms should be connected to the Internet by the year 2000, and **all teachers must be trained to integrate this technology into the curriculum**" (U.S. Department of Education, 1996, as quoted in Williams & Kingham, 2003, p. 2).

Brand (1997) explained that there is a need for "increased access to information through new technologies, along with the need to prepare children to compete in an emerging information-based global economy, which promises to fundamentally reshape school practice as we move into the next century" (p. 1).

Slide 17



Slide 18



Support for Teacher Professional Development

"In order for the Internet to reach its fullest potential, teachers must be working at higher levels..."
(Doherty, 1998, as cited in Williams & Kingham).

When teachers work at higher levels, they "construct curriculum and projects not possible without the use of the Internet...and students construct their own projects; their learning and use of the Internet is self-directed" (as quoted in Williams & Kingham, p. 3).




The single most important factor in the effective use of technology is the quality of the teacher knowledge of effective technology uses in instruction.

The effect of technology on students' access to knowledge is determined by the pedagogical knowledge and skill of teachers.

Technology enables teachers with well-developed working theories of student learning to extend the reach and power of those theories; in the absence of these powerful theories, technology enables mediocrity.

Coppola suggested that **educational technology use that is not supported by teacher training can ultimately lead to a worsening of teaching practices**, because these tools require a degree of skill in order to be utilized effectively.

Williams and Kingham (2003) stated that, "Doherty (1998) **warns against the Internet becoming a passive learning technology by serving only a lower level information retrieval function**" (p. 4).



How are students using the educational technology in your school?

Are students working at higher levels by using technology to construct knowledge, or are they simply assigned to a computer or software program to carry out a task?

Examples of low level instructional technology use:

Students using:

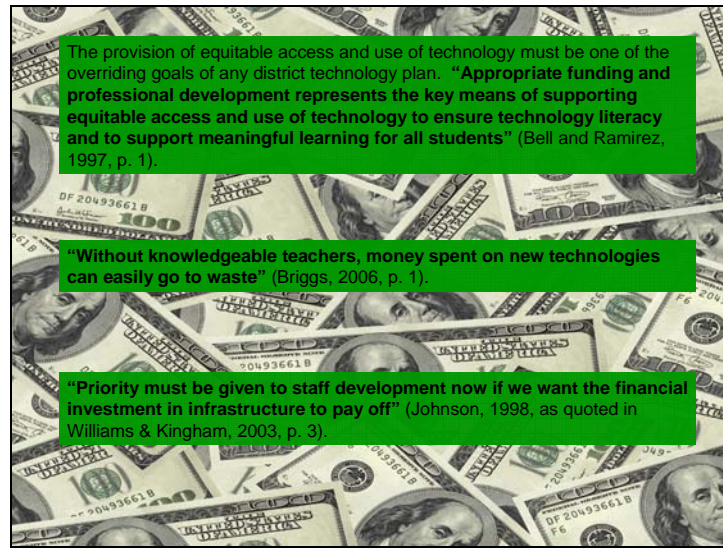
- "Skill and Drill" math software for practicing unrelated skills.
- The Internet for "Surfing."
- The Internet for Social Studies research that is highly directed.
- Technology passively with no accountability.

Examples of high level instructional technology use:

Students using:

- ✓ Educational software with a specific purpose. Students have clear objectives and teacher student interaction is obvious.
- ✓ The Internet for self-directed study of a subject. Knowledge construction is a central focus and student seeks knowledge beyond the school walls. Teacher acts as a guide.
- ✓ Technology to actively learn. Signs of students reflection are evident through discussion or knowledge building activities.

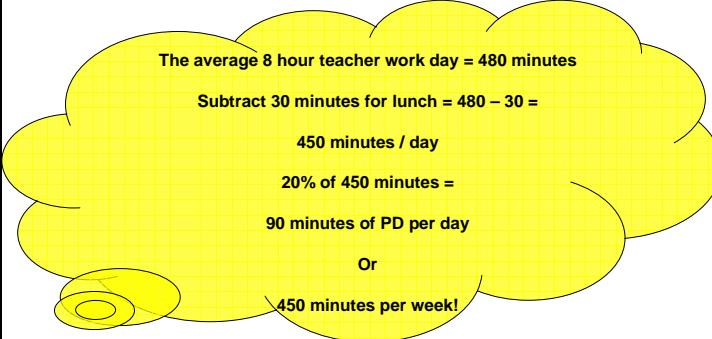

Slide 23



Slide 24



When professional development is redefined as a central part of teaching, most decisions and plans related to embedding professional development in the daily work life of teachers will be made at the local school level. Some reformers recommend that at least 20 percent of teachers' work time should be given to professional study and collaborative work.



The average 8 hour teacher work day = 480 minutes

Subtract 30 minutes for lunch = $480 - 30 =$

450 minutes / day

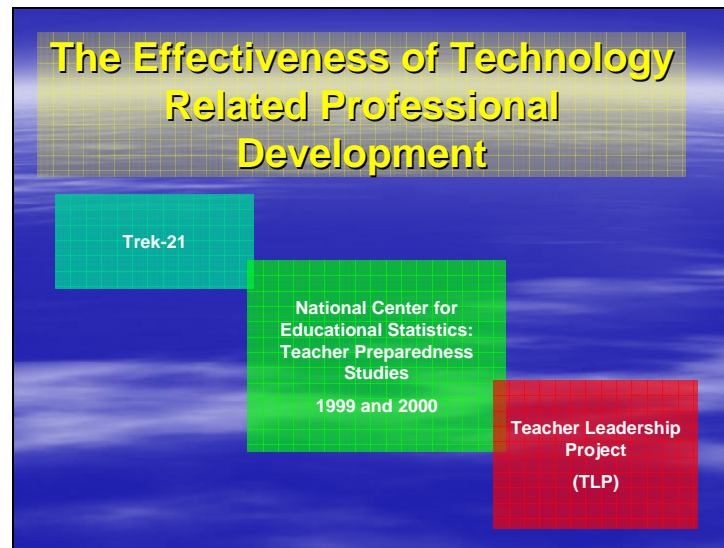
20% of 450 minutes =

90 minutes of PD per day

Or

450 minutes per week!

Slide 27



Slide 28


**National Center for Educational Statistics:
1999 Teacher Preparedness Study**

In general, teachers who had participated in professional development in a content area were more likely than their peers to indicate that they felt very well prepared for that area.

As the number of hours of technology integration training increased, so did a teacher's feelings of preparedness.

When teachers participated in collaborative activities, such as: (a) networking with other teachers, (b) collaborative research on a topic of interest, (c) regularly scheduled collaboration, (d) mentoring, or (e) being mentored, they were more likely to report feeling well prepared to integrate technology.

Slide 29



National Center for Educational Statistics: 2000 Teacher Preparedness Study

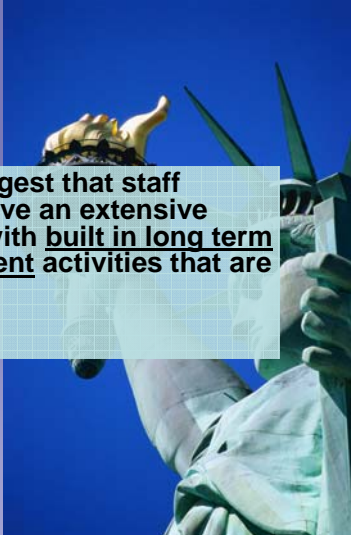
The researchers at NCES (2000) wrote, “**the number of hours teachers spent in professional development activities was related to the extent to which they believed that participation improved their teaching**” (p. 2).

Professional collaboration was considered by teachers to have improved their teaching.

The frequency of collaboration had a positive influence on teacher perceptions of performance.

Certain follow-up activities to professional development, such as helping each other implement new ideas, demonstrated a positive impact on teacher perceptions of preparedness to meet the overall demands of their teaching assignment.

Slide 30



The NCES findings suggest that staff development should have an extensive collaborative element with built in long term professional development activities that are team oriented.

**Teacher Leadership Project
(TLP)**

- Four intensive workshop training sessions
- Several days each
- Over 10 month period
- Hands-on opportunities to learn new instructional technology methods
- And time to integrate them into their existing lessons

Specific training methods included:

- Teachers training teachers
- Time for journaling
- Time for sharing technology lessons with peers
- Exploratory projects
- Help-desk sessions
- Technology infusion theory
- Application software use / theory

Dean reported that the TLP positively impacted teachers':

- attitudes toward technology integration
- self-efficacy
- frequency of technology integration

Additionally, teachers who attended the trainings perceived that the instructional technologies they used had a greater impact on their role as a teacher and on student learning experiences.

Results from this study demonstrated that there was a correlation between long term technology integration training opportunities and improvements in teacher attitudes toward instructional technologies.

Slide 33

After participation in Trek 21, teachers demonstrated:

- A greater preference for learner centered teaching
- Improved instructional technology competencies
- Instructional design utilizing active student engagement
- Excellent long term use of instructional technologies

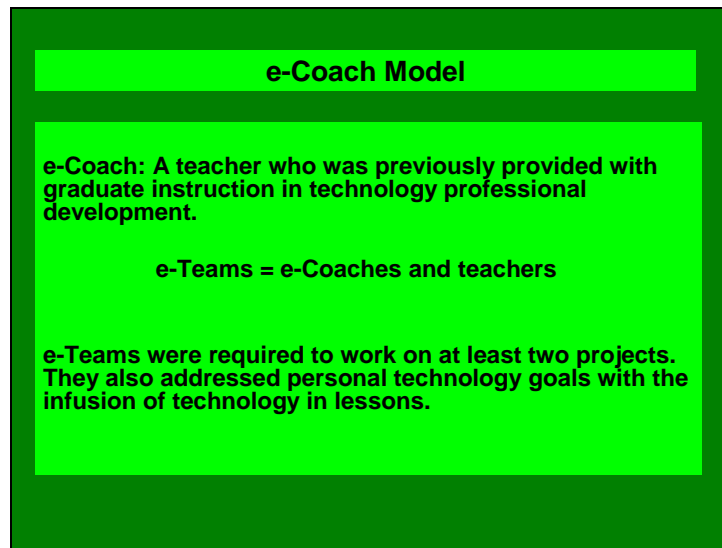
Slide 34

Trek-21 Project

“Trek 21 is a three-year project designed to bring about a deep lasting change in educators through the integration of instructional technologies (ITs) into their teaching” (Kuhn, et. al., 2003, p. 1).

Trek 21 provides a cycle of opportunities for teachers to:

- study lessons
- develop technical skills
- work collaboratively to improve their teaching
- receive coaching



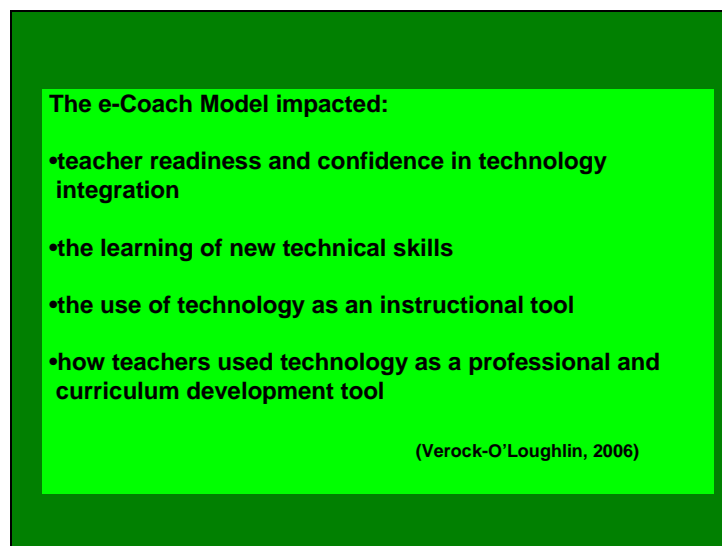
The diagram for Slide 35 is titled "e-Coach Model" in a red box. Below the title, a large light blue box contains the definition of an e-Coach and the structure of e-Teams. The text is as follows:

e-Coach Model

e-Coach: A teacher who was previously provided with graduate instruction in technology professional development.

e-Teams = e-Coaches and teachers

e-Teams were required to work on at least two projects. They also addressed personal technology goals with the infusion of technology in lessons.



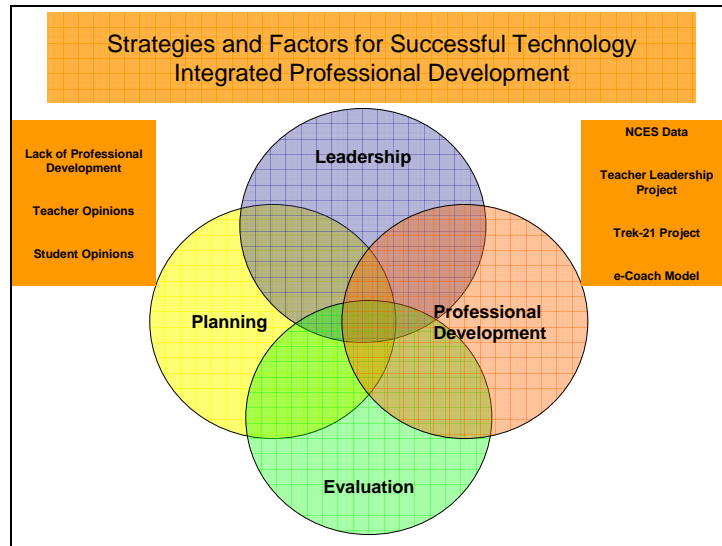
The diagram for Slide 36 is titled "The e-Coach Model impacted:" in a red box. Below the title, a large light blue box contains a bulleted list of impacts. The text is as follows:

The e-Coach Model impacted:

- teacher readiness and confidence in technology integration
- the learning of new technical skills
- the use of technology as an instructional tool
- how teachers used technology as a professional and curriculum development tool

(Verock-O'Loughlin, 2006)

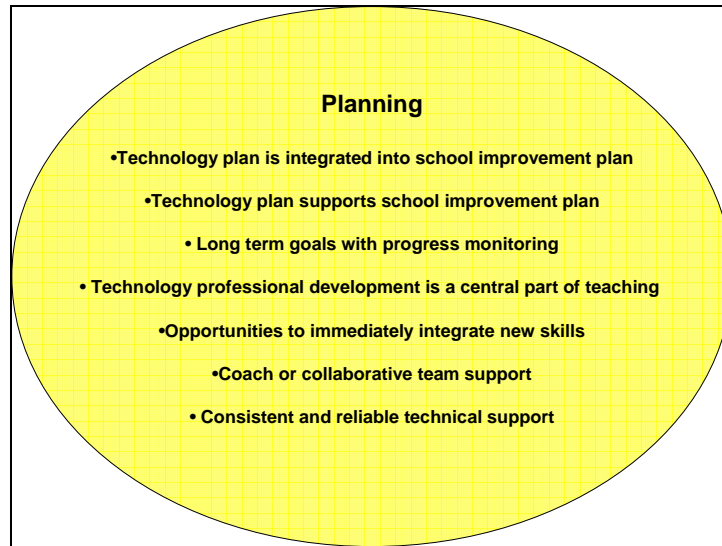
Slide 37



Slide 38



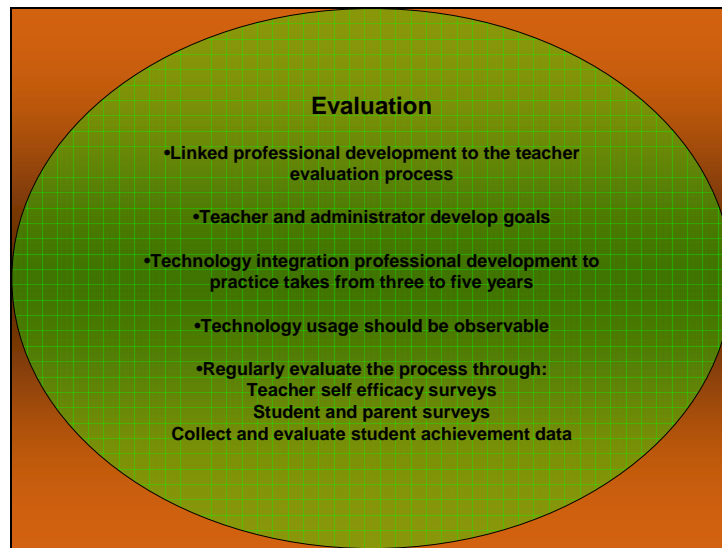
Slide 39



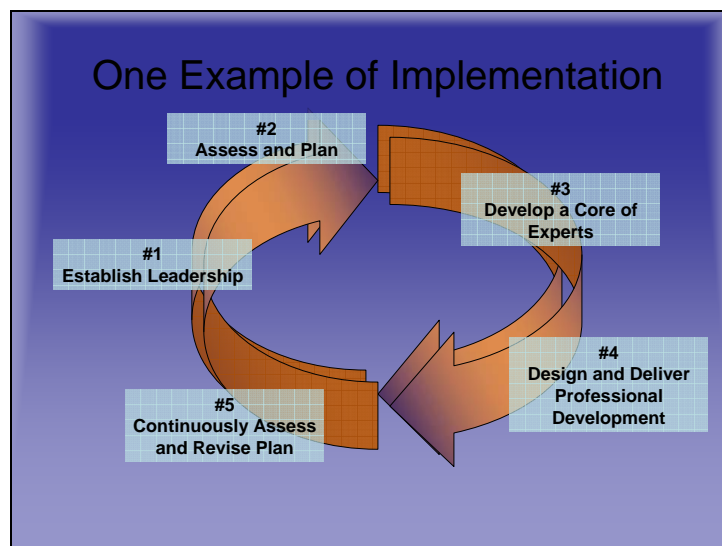
Slide 40



Slide 41



Slide 42



Slide 43

#1 Establish Leadership

- Form a Technology Cadre
- Grade Level/Content Areas
- Representative of the learning community
- Provide time to meet and work
- Compensate cadre members

Slide 44

#2 Assess and Plan

- Collect baseline data related to tech. integration
- Survey learning community regarding attitudes and needs

Create a technology plan that:

- Supports the school's improvement plan goals
- Supports the professional development needs of teachers
- Addresses the resource needs of teachers
- Contains a plan for monitoring success

#3

Develop a Core of Experts

(Most often the tech cadre)

Teachers who have:

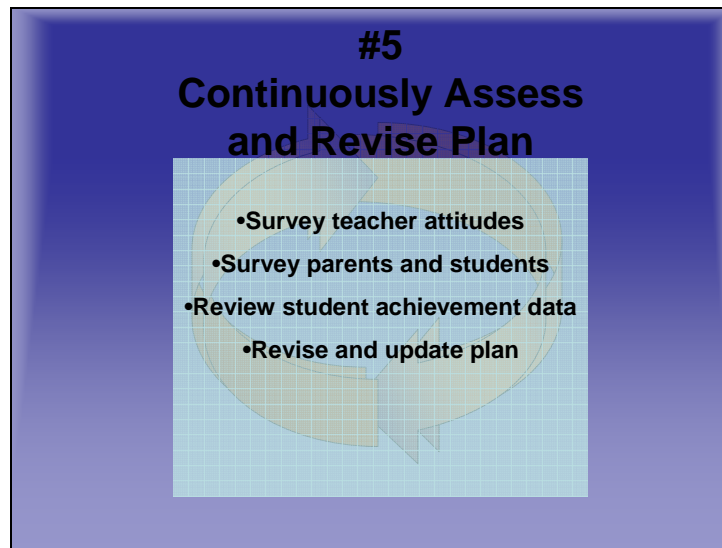
- Training in technology integration
- Experience integrating technology in the school
- An understanding of how to train adults

#4

Design and Deliver Professional Development

- Based on needs assessment
- Coaching, Collaborative studies
- Reflection
- PD events
- Long Term

Slide 47



Slide 48

In Conclusion...

“Technology involves the tools with which we deliver content and implement practices in better ways”
(Earle, n.d., as quoted in Holznogel, 2005, p. 1).

Technology enables a teacher with the appropriate tools to:

- Motivate students with engaging schoolwork
- Teach vital skills that will enable learners to take control of their learning
- Improve the effectiveness of teaching
- Increase collaboration within the entire learning community

Chapter Summary

Technology Integration Professional Development for Teachers: Strategies for Action is a PowerPoint presentation intended to impact the attitudes of school administrators. This 51 slide presentation contains research and commentary that this researcher will use to support his efforts as an administrator and school reformer. It is this researcher's hope that, after viewing this presentation and engaging in meaningful conversations, school leaders will view technology related professional development as an important part of their school's mission. With the strategies that are recommended in this presentation, administrators will be better equipped to lead their staff members toward the acquisition of effective educational technology integration skills that, as an end result, impact student achievement to a high degree.

Chapter 5

DISCUSSION

Contribution of Project

Each member of the evaluation team expressed that this presentation met the objectives of this project and provided a valuable resource. Through the interview process, this researcher gathered that many of the concepts that were presented in this work were new to both of the administrators, but seemed to be common knowledge to the Educational Technology and Information Literacy (ETIL) department evaluator. However, the ETIL department evaluator did express that, due to a lack of leadership support, embedded forms of professional development and increased collaboration among staff were extremely difficult to implement across the district. These comments not only enlightened this researcher to the educational needs of the two administrators interviewed, but also demonstrated a disconnect between the expectations of the ETIL department and administrators within the district. Additionally, the two administrators expressed that, after viewing the presentation, they felt compelled to learn more about technology related professional development. Consequently, this researcher has been asked to attend the school improvement team meetings as a means to generate more discussion surrounding professional development at the school.

The positive response of the interview team to the presentation and the interest sparked in each administrator indicated that this information could impact administrator practice. As this researcher develops this project further and adds new information to it,

it will undoubtedly serve as a central part of his philosophy and approach toward leadership.

Limitations

During the development phase of the project proposal, this researcher believed that it was possible to create a start-to-finish guide to professional development for administrators to follow. However, through the review of literature and discussions with administrators, it became apparent that the differences in school environments and cultures made it impossible to present a “one size fits all” guide to technology professional development. For this reason, this researcher modified his project to a presentation of general strategies that school leaders could use to develop technology related professional development in a school. Though this modification seemed to increase the applicability of this project to more schools, the vagueness of the information and the lack of specific recommended actions seemed to limit the potential impact. Therefore, this researcher believes that, for this presentation to have maximum impact on schools, it must be accompanied by a facilitated conversation. For example, if a school’s improvement team uses this presentation to develop a technology professional development plan, a facilitator is necessary to guide the conversation toward the attainment of this goal. If this presentation is used by a group of administrators, the conversation would focus more on the general strategies that are recommended and the specific challenges each leader may face in their school. This researcher believes that this presentation will best serve as a catalyst for change when used as part of an overall school reform effort.

Peer Assessment

Each evaluator was provided a CD containing the presentation and verbal directions explaining how to load and play the presentation in Microsoft PowerPoint. Each presentation contained an audio narration that served as the live presenter. Initially, the evaluators were confused regarding how to load the presentation. This delayed the assessment process and required this researcher to provide technical support. Though this was not mentioned as an issue by any of the evaluators during the interview process, it is clear to this researcher that ease of access would be critical to the success of this type of presentation.

After viewing the presentation, each evaluator was asked a series of questions that were intended to provide structured feedback. When evaluators were asked how well this project met the original objective, each indicated that the project did provide a comprehensive set of strategies. Two evaluators described how they could see the presentation being used with a leadership team to support professional development initiatives. All evaluators indicated that the presentation was engaging and that the format of each slide was easy to follow and understand. When asked if this presentation would be a valuable resource, each evaluator indicated that it could be if an administrator was provided with support. Two evaluators discussed how this presentation needed to be part of an overall workshop, where a coach working with an administrator or leadership group should be present to assist with the process of developing the technology integration related professional development program. When the evaluators were asked if they could suggest any additional changes for future revisions to this work, two of the members took time to go through it and edit the entire presentation. Many of the errors

they mentioned were related to inconsistencies in the presentation of quotes and personal preferences for the display of text. For example, one evaluator recommended that a textbox, which was aligned along the right edge of the slide be aligned to the left. Minor editing changes were made to the final version of this presentation, included in Chapter 4.

Recommendations for Future Research and Study

Though the evaluation team expressed that this project fulfilled the objective of providing effective strategies for school administrators, the team did make recommendations for future research and study. Two evaluators expressed interest in seeing more examples of exemplary professional development programs that they could draw from for their own work. Another evaluator expressed interest in seeing more information on the specific skills teachers needed in order to be considered competent technology integrators. As this researcher drafted the presentation, it became apparent that data was needed demonstrating the impact of technology related professional development on student achievement.

Project Summary

This project was important to this researcher for many reasons. As a technology coordinator in the public school environment, this researcher has seen a wide array of responses by school leaders to the issue of technology integration. Some school administrators have acted with appropriate responses that were well planned, utilizing a high degree of shared decision making, while other school administrators have not. As a future administrator, this researcher felt compelled to investigate this subject and create a product that not only could serve his own future needs, but possibly the needs of others. Through the review of literature, this researcher gained the necessary background on this

subject to create a presentation that fulfilled the original project objective. Through the drafting phase of this project, this researcher gained understanding surrounding the complexities of developing a live presentation and an appreciation for the amount of work necessary to create a comprehensive research based presentation. The assessment of this project was important to this researcher because it provided valuable insight into how this presentation should be used, and how it could impact technology integration related professional development in a school. Each evaluator provided valuable feedback during and after this process that will be used to improve future revisions. The development of this project as a live presentation makes it something that is accessible to a large number of people; however, the vagueness of the information makes its potential impact questionable. When presented to future administrators, this work will receive many of the revisions suggested by the assessment team, but most importantly, it will be tailored to the specific environment in which it will be used. The research that is presented to support technology related professional development and the provided examples of exemplary professional development programs will be chosen with careful consideration for their potential applicability to each school environment and culture.

REFERENCES

- AllPsych Online. (2004, March, 21). *Research methods: Chapter 5: Experimental design*. Retrieved April 27, 2004, from <http://allpsych.com/researchmethods/preexperimentaldesign.html>
- Ansell, S. E., & Park, J. (2003). Tracking tech trends. *Technology counts 2003: Technology's answer to testing*, 22(35), 1-4, 48. Retrieved April 10, 2007, from http://counts.edweek.org/sreports/tc03/article.cfm?slug=35tracking_h22
- Arafeh, S., & Levin, D. (2002). *The digital disconnect: The widening gap between Internet-savvy students and their schools*. Retrieved March 12, 2007, from http://www.pewinternet.org/pdfs/PIP_Schools_Internet_Report.pdf
- Bausell, C. V., & Klemick, E. (2007, March 29). Tracking U.S. trends. *Technology counts: A digital decade*, 26(30), 1-8. Retrieved April 20, 2007, from <http://www.edweek.org/ew/articles/2007/03/29/30trackingtrends.h26.html>
- Bell, R., & Ramirez, R. (1997). *Critical issue: Ensuring equitable use of education technology*. Retrieved March 30, 2007, from <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te400.htm>
- Brand, G. A. (1997). What research says: Training teachers for using technology. *Journal of Staff Development*, 19(1), 1-6. Retrieved March 30, 2007, from <http://www.nsd.org/library/publications/jsd/brand191.cfm>
- Briggs, L. (2006). A mobile cause. *THE Journal*, 33(8), 20-21. Retrieved March 11, 2007, from Academic Search Premier database.
- Brinkerhoff, J. (2006, Fall). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, 39(1), 1-22. Retrieved April 30, 2007, from ProQuest database.
- Burns, K., & Polman, J. (2006). The impact of ubiquitous computing in the Internet Age: How middle school teachers integrated wireless laptops in the initial stages of implementation. *Journal of Technology Teacher Education*, 14(2), 1-23. Retrieved March 18, 2007, from ProQuest database.
- Bush, G. (2005). Logging on to staff development. *T H E Journal*, 32(11), 1-4. Retrieved March 11, 2007, from <http://thejournal.com/articles/17309>

- Cook, C. J., & Fine, C. (1997). *Critical issue: Finding time for professional development*. Retrieved March 30, 1997, from <http://www.ncrel.org/sdrs/areas/issues/educatrs/profdevl/pd300.htm>
- Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan*, 76(8), 1-8. Retrieved April 5, 2007, from ProQuest database.
- Dean, D. E. (2000, November). *Infusing technology in K-12 classrooms: A study of one method used to prepare teachers to integrate information technologies into their teaching*. Retrieved April 17, 2007, from ProQuest database.
- Edweek.org, (2007). *Technology in education*. Retrieved March 25, 2007, from <http://www2.edweek.org/rc/issues/technology-in-education/>
- Holznogel, D. (2005, Winter). Is technology integration happening? How can I tell? *NETC Circuit*, 1-5. Retrieved March 20, 2007, from <http://www.netc.org/circuit/2005/winter/tech.html>
- Kuhn, A. L., Lemani, C. N., Wells, D. L., Mitchem, K. J., & Wells, J. G. (2003). *Integration of instructional technologies and change in teacher practice*. West Virginia University. Retrieved April 12, 2007, from http://www.trek-21.wvu.edu/html/disfiles/eera2003/eera2003_lemani_kuhn_wells.pdf
- Lemani, C. N. (2004). *Effectiveness of Trek-21 model of professional development on changes in teacher practices with respect to instructional technology integration*. Retrieved March 20, 2007, from ProQuest database.
- Lewis, L., & Wells, J. (2006, November). *Internet access in U.S. public schools and classrooms: 1994–2005*. Retrieved March 30, 2007, from <http://nces.ed.gov/pubs2007/2007020.pdf>
- Loucks-Horsley, S. (1996). *A definition of professional development*. Retrieved April 24, 2007, from http://teech.terc.edu/lectures/lectures/louckshorsely_def_nsta96.htm
- Malitz, G., Rogers, A., & Szuba, T. (2005). *Forum Unified Education Technology Suite*. Retrieved April 5, 2007, from http://nces.ed.gov/pubs2005/tech_suite/part_8.asp
- McLeod, S. (2006, October 4). *What does technology integration mean?*. Retrieved March 12, 2007, from http://www.dangerouslyirrelevant.org/2006/10/what_does_techn.html

- National Center for Educational Statistics. (1999). *Teacher quality: A report on the preparation and qualifications of public school teachers: Executive Summary*. Retrieved March 24, 2007, from <http://nces.ed.gov/surveys/frss/publications/1999080>
- National Center for Educational Statistics. (2000). *Teacher preparation and professional development: 2000*. Retrieved March 30, 2007, from <http://nces.ed.gov/surveys/frss/publications/2001088/>
- National Center for Research on Teacher Learning. (1995, February). *Learning to walk the reform talk: A framework for the professional development of teachers*. Retrieved June 14, 2007, from <http://ncrtl.msu.edu/http/walk.pdf>
- National Staff Development Council. (2007). *What is staff development?* Retrieved April 13, 2007, from <http://www.nsd.org/library/basics/whatisSD.cfm>
- No Child Left Behind Act of 2001, Pub. L. No. 107-110, Title II, Part D. Retrieved June 30, 2007, from <http://www.ed.gov/policy/elsec/leg/esea02/index.html>
- Pennsbury School District. (n.d.). *Staff development: Definition/purpose*. Retrieved April 4, 2007, from <http://www.pennsbury.k12.pa.us/documents/staffdevelopment.pdf>
- Schrum, L., & Glassett, K. F. (2006, Spring). Technology integration in P-12 schools: Challenges to implementation and impact of scientifically-based research.. *Journal of Thought*, 41, 1-17. Retrieved May 6, 2006, from ProQuest database.
- Southeast Initiatives Regional Technology in Education Consortium. (n.d.). *Factors that affect the effective use of technology for teaching and learning*. Retrieved April 19, 2007, from <http://www.serve.org/seir-tec/publications/lessondoc.html>
- Valdez, G. (2004, July). *Critical issue: Technology leadership: Enhancing positive educational change*. Retrieved March 24, 2007, from <http://www.ncrel.org/sdrs/areas/issues/educatrs/leadrshp/le700.htm>
- Valdez, G. (2005). *Critical issue: Technology: A catalyst for teaching and learning in the classroom*. Washington, DC: American Institutes for Research. Retrieved March 25, 2007, from <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te600.htm>
- Viadero, D. (2007). The focus of the research agenda for school technology has shifted from innovation to effectiveness. *Education Week*, 26(30), 30, 1-7. Retrieved April 24, 2007, from <http://www.edweek.org/ew/articles/2007/03/29/30tcresearch.h26.html>
- Verock-O'Loughlin, R. (2006, February). *Impacts of technology coaching on teacher practices*. Retrieved March 28, 2007, from ProQuest database.

Williams, H., & Kingham, M. (2003). Infusion of technology into the curriculum.
Journal of Instructional Psychology, 30(3), 1-12. Retrieved March 11, 2007 from
Academic Search Premier database.